Engineering

Concrete Fundamentals (ENG 115)

Overview

This course instructs the trainee in the selection of materials, design of mixes, mixing of ingredients, testing, placement, finishing and curing of quality concrete. Subjects covered are: types of cements, selections of aggregates, air entrainment additives and other additives; proportioning mixes; mixing sampling and testing fresh concrete; placing, finishing, and curing concrete; placing steel reinforcement, forming and inspection of concrete.

Objectives

Upon completion of this training, participants will be able to:

1. identify the fundamentals and principles of quality concrete.
2. proportion concrete mixes to attain described strengths as presented in ACI Standards and manuals by the Portland Cement Association.
3. prepare concrete mixes and perform concrete field tests.
4. prepare samples for concrete compression strength tests and recognize proper testing methods and cylinder breaks.
5. explain the need for good inspection of the pre-placement, placement, and post-placement of suborder, forms, steel, and concrete.
6. list the requirements of NRCS Construction Specifications for concrete construction.
7. describe the procedures for evaluating concrete deficiencies and selecting appropriate repair methods.

Prerequisites

None. It is not recommend that participants attend this course and Construction Inspection in the same year.

Duration

1 week

Eligibility

Engineers, construction inspectors and field technicians, or those who will be assigned responsibilities relating to the design or construction of concrete structures may attend this course.

Engineering

Construction Inspection (ENG 125)

Overview

This training is primarily for the construction inspector engaged in various project type work and more complex work in conservation operations. It includes: earthwork, reinforced and plain concrete; forms and forming; rockwork; how to take samples and make field tests; how to interpret drawings and specifications; and documentation of information pertinent to construction. The content covers the "inspector's job" including what to do and how to do it. It includes earthen structures, concrete, steel, rock, and geotextiles.

Objectives

Upon completion of this training, participants will be able to:

1. interpret basic contract provision in relation to construction inspection duties and responsibilities.
2. maintain records to document information pertinent to construction quality control and compliance to the contract provisions, plans, and specifications.
3. interpret drawings and specifications and required test results in terms of the project being constructed.
4. identify the critical aspects and required field tests for mixing, placing, finishing, and curing concrete for various structural applications.
5. explain the necessary procedures and field testing for placing and controlling earth and rock fills in structural measures.
6. describe the necessary procedures for the proper selection of materials and installation of various slope protection measures that include rock rip rap, concrete blocks, gabions, and related materials.
7. list the safety requirements and identify unsafe conditions on a construction site.

Prerequisites

Basic knowledge of algebra and general math and some field experience in the installation of basic conservation structural measures. It is not recommend that participants attend this course and Concrete in the same year.

Duration

1 to 2 weeks

Eligibility

Engineers, construction inspectors, and field technicians or those who will be assigned responsibility in the construction field may attend.

Engineering

Designing with Geosynthetics (ENG 185)

Overview

This course includes geosynthetic manufacturing processes and material properties; and uses of geotextiles, geogrids, geomembranes, and geocomposites. Design and installation procedures using geotextiles for separation, reinforcement, stabilization, filtration, drainage, and multiple functions are also covered. Similar design procedures are given for geogrids, geomembranes, and geocomposites. Emphasis is on NRCS engineering measures.

Objectives

Upon completion of this training, participants will be able to:

1. define and explain the four basic types of geosynthetics.
2. plan a site investigation to secure needed field data.
3. evaluate material properties of geosynthetics.
4. prepare a design analysis for a specific function.
5. select the appropriate type of geosynthetic based on design analysis, function, and cost.

Prerequisites

Basic understanding of soils engineering and structural design concepts of NRCS engineering measures.

Duration

3 days

Eligibility

Design, soil mechanics, construction, planning, project, area, and agricultural engineers; landscape architects; and geologists may attend.

Engineering

Hydrology - Level III (ENG 250)

Overview

This course enables participants to use NRCS hydrologic criteria and procedures to correctly design soil and water conservation measures. Emphasis is placed on hydrologic procedures and concepts used in the design of earth dams and determining peak rates of run-off and the effect of urbanization on the peak and volume of run-off.

Objectives

Upon completion of this training, participants will be able to:

1. correctly interpret hydrologic policy used in the design of soil and water conservation measures.
2. correctly use hydrologic criteria and procedures in the design and installation of soil and water conservation measures.
3. correctly use hydrologic criteria and procedures in the design and installation of medium to large size structural measures.

Upon completion of this training, the participant should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

Engineering - Hydrology part of NPEG-I or Hydrology Training Series Modules 101-107, 111, 116, 201-203, 206A, and 206B

Duration

1 week

Eligibility

All engineers and very experienced technicians involved in design of conservation measures on farms, ranches, watersheds, and in urban areas may attend. This course is not recommended for practicing hydraulic engineers. They should attend Hydrology Level IV within their first two years of involvement.

Engineering

Hydrology - Level IV (ENG 260)

Overview

Participants will learn: the role of the hydraulic engineer in Natural Resources Conservation Service; coordination with other disciplines; basic statistics; infiltration hydrographs (assume knowledge of Chapter 16 of NEH-4); effects of urbanization; computer programs (including TR-20; WSP-2, etc.); stage-area relationships; reservoir operation studies; annual yield studies; and use of stream gage data.

Objectives

Upon completion of this training, participants will be able to:

1. identify the duties of hydraulic engineers and the relationship of their jobs to other staff members.
2. route through complex channel systems and develop stage and area flooded relationships.
3. use regional analysis and calibration techniques to adequately model watershed hydrology.
4. calculate water yield from large drainage areas.

Upon completion of this training, the participant should be able to perform at ASK Level 4, Perform Independently.

Prerequisites

Engineering - Hydrology Training Series Modules 101-107, 111, 116, 201-203, 206A, and 206B

Duration

1 week

Eligibility

Hydraulic engineers with less than two years' experience, water supply specialists, and other engineers involved in water resource planning may attend. This course is not recommended for engineers with over five years' experience in water resources.

Engineering

Image Processing: Basics (ENG 301)

Overview

This course covers the installation of peripherals; hardware/software used in image processing; hands-on input of pictures and windows from photos, slides and video tapes; hands-on modification and manipulation of images using basic commands in TIPS software; hands-on output of pictures using Slide Presentation Software and related wipes and time variations; and basic ethics and legality of image processing.

Objectives

Upon completion of this training, participants will be able to:

1. describe image processing and its benefits to NRCS.
2. recognize common applications for image processing.
3. plan an image processing production.
4. use image processing software.
5. determine image processing needs and specifying requirements.
6. develop image processing products for the agency.

Upon completion of this training, the participant should be able to perform at ASK Level 3, Perform with Supervision; and, after completing additional on-the-job projects, perform at ASK Level 4, Perform Independently.

Prerequisites

None

Duration

36 hours

Eligibility

Managers and users of image processing systems or those who plan to acquire one within the next six months may attend.

Image Processing: Advanced Techniques (ENG 311)

Overview

This course reviews basics, and emphasizes advanced menu options, such as color spreading, tinting, blending pattern creation and use. It also includes use of RIO, file storage and transfer techniques, and an overview of other image processing hardware/software currently on the market. The hands-on course includes a studio seminar covering alternative methods of image processing and current trends in the industry. An update on ethics and legality of processed images is provided with a discussion on current methods and standards for image processing. Time is allowed for discussion of inter-agency image processing opportunities and applications.

Objectives

Upon completion of this training, participants will be able to:

1. utilize TIPS, RIO, and Slide Presentation Software as an image processing package for agency related applications and benefits.
2. discuss benefits and potential agency application for TOPAS animation and other image processing software.
3. plan an image processing production with accompanying sound track.
4. observe and apply techniques to teach basic image processing to others.

Upon completion of this training, the participant should be able to perform at ASK Level 5, Instruct Others.

Prerequisites

ENG - Image Processing: Basics or equivalent

Duration

36 hours

Eligibility

Managers and users who have completed the Image Processing: Basics course, or have equivalent knowledge and skills; or those that have Image Processing training responsibilities may attend.

Engineering

Landscape Architecture (ENG 402)

Overview

This course includes:

1. a general understanding of landscape architecture and changes that have occurred in landscape stewardship down through the years.
2. landscape architecture in NRCS: NRCS policy on landscape architecture and current state-of-the-art within NRCS.
3. landscape management principles and concepts.
4. application - NRCS planning, design and construction: a basic understanding of landscape management procedures and techniques and how to apply them to NRCS activities.
5. field exercise and presentation: experience in applying previously discussed landscape management concepts and techniques in a monitored working situation.

Objectives

Upon completion of this training, participants will be able to:

1. explain the basic principles of landscape architecture.
2. apply landscape management concepts and techniques to NRCS planning, design, construction, and maintenance activities.
3. communicate NRCS policy regarding landscape architecture.

Upon completion of this training, the participant should be able to perform at ASK Level 3, Perform with Supervision.

Duration

1 week

Eligibility

Individuals from any office or discipline who are involved in planning, design, or construction activities that have a potential impact on the landscape may attend.

Engineering

Orientation for Engineers, Geologists, and Landscape Architects (ENG 412)

Overview

This self paced training introduces new engineers, geologists, and landscape architects to the application of academic training to NRCS work. It includes orientation on engineering, geologic, and landscape architecture disciplines and diversity of work and advancement opportunities. This training uses case studies to provide insight into the interdisciplinary method of addressing resource management opportunities.

Objectives

Upon completion of this training, participants will be able to:

1. describe the role of engineers, geologists, and landscape architects in the overall mission of NRCS.
2. describe interdisciplinary involvement in the planning, design, and construction of conservation measures.
3. list and explain, with notes, the technical reference materials necessary for engineers, geologists, and landscape architects to carry out their technical functions.
4. describe the role of professionalism in the engineering decision making process.
5. develop an outline for achieving career development goals including technical and professional skills.

Prerequisites

MES - Introduction to NRCS

Duration

24 hours

Eligibility

Engineers, geologists, and landscape architects with less than one year of NRCS experience.

Soil Bioengineering (ENG 505)

Overview

This course describes how vegetation and structures can be used together in attractive environmentally compatible and cost-effective ways for protecting upland slopes, streambanks and shorelines. Methods and construction techniques for soil bioengineering systems on small, uncomplicated sites are covered in detail with planning.

Objectives

Upon completion of this training, participants will be able to:

1. describe basic principles and functions of small, uncomplicated soil bioengineering systems.
2. describe basic soil bioengineering methods and construction techniques.
3. describe common applications and recommend soil bioengineering methods for small, uncomplicated sites when appropriate.
4. participate in the planning and design of a small, simple soil bioengineering system, including drawings and specifications.
5. describe small, simple construction and installation aspects of soil bioengineering.
6. assist in preparation of a related operations and maintenance plan.

Participants who complete this course should be able to perform at ASK Level 3, Perform with Supervision.

Duration

32 hours

Eligibility

Individuals who plan, design, or install conservation practices and who anticipate they will be utilizing small, simple soil bioengineering systems or those that will be coordinating work to be done with others may attend.

Engineering

Soil Engineering in Conservation Operations (ENG 515)

Overview

This course shows how basic soil engineering properties can be used to solve practical problems encountered in conservation operations work. Subject areas include review of soil classification and volume weights; compaction; permeability; shear strength; bearing capacity, geosynthetics; filters; channels; dispersive clays; engineering chapter of the soil survey; site investigations and evaluations; animal waste storage ponds and sewage lagoons; problem soils; construction considerations; and failures - causes and solutions.

Objectives

Upon completion of this training, participants will be able to:

1. evaluate items to consider for a site selection and geological investigation.
2. evaluate the engineering properties of soils.
3. evaluate designs for simple sites from a qualitative standpoint.
4. recognize when special assistance is necessary.

Prerequisites

Soil Mechanics: Modules 1,2,3 - Classification of Soils-Level I; Module 4 - Volume Weight Relationships; Module 5 - Compaction

Duration

1 week

Eligibility

New engineers and geologists, advanced technicians, and soil scientists may attend.

Other Information

This one week session, Soil Mechanics Modules 1-5, 14 Hydrology Training Series modules (101–107, 111, 116, 201–203, 206A, and 206B), plus the Orientation for New Engineers, Geologists, and Landscape Architects make up the equivalent of the former NPEG course.

Engineering

TR-20, Advanced (ENG 800)

Overview

This course covers how the TR-20 computer program performs computations. The course covers how to use the advanced routines of the computer program such as divert, divide, null structures and how to develop the input data in the proper format. It also discusses how to interpret the output.

Objectives

Upon completion of this training, participants will be able to:

1. identify and use the non-basic hydrologic and hydraulic processes used by the TR-20 computer program, such as divert, divide, null structures, etc.
2. select the proper processes to use when modeling special or unique watershed conditions.
3. determine the input variables used to model a watershed with special or unique conditions.
4. analyze the output to determine if the TR-20 computer program has correctly modeled the special or unique watershed conditions.

Upon completion of this training, the participant should be able to use all the routines of the TR-20 computer program to model a watershed with unique or special conditions at ASK Level 4, Perform Independently.

Prerequisites

Basic TR-20 Course

Duration

2 or 3 days, depending on whether or not computer terminals are used during the training

Eligibility

Hydrologists or hydraulic engineers, water supply forecast unit hydrologists, and engineering technicians who are performing TR-20 watershed model studies may attend.

Engineering

TR-20, Basic (ENG 810)

Overview

This course covers the basic concepts of NRCS hydrologic techniques and how the TR-20 computer program performs computations. It covers how to use the basic routines of the computer program such as runoff, reservoir, reach, add hydrographs, and how to develop the input data in the proper format. It also discusses how to interpret the output.

Objectives

Upon completion of this training, participants will be able to:

1. identify and use the hydrologic processes used by the TR-20 computer program, such as runoff, reservoir routing, stream routing, and add hydrographs.
2. select the proper processes to use when modeling a watershed.
3. determine the input variables used to model a watershed with the TR-20 computer program.
4. analyze the output to determine if the TR-20 computer program has correctly modeled the watershed.

Upon completion of this training, the participant should be able to use the basic routines of the TR-20 computer program to model a watershed at ASK Level 3, Perform with limited supervision.

Prerequisites

None

Duration

2 or 3 days, depending on whether or not computer terminals are used during the training

Eligibility

Hydrologists or hydraulic engineers, water supply forecast unit hydrologists, and engineering technicians who will be performing TR-20 watershed model studies may attend.

Engineering

Geology Training Series Groundwater Correspondence Course

Overview

The two-course program is made up of twelve modules:

Course 1: A - Properties and Principles of Groundwater Systems; B - Flow Behavior; C - Hydrogeochemistry; D - Groundwater Exploration Techniques; E - Groundwater Measurement Techniques

Course 2: F - Groundwater Occurrence; G - Groundwater Development; H - Well Design and Construction; I - Artificial Recharge; J - Groundwater Resource Management; K - Groundwater Contamination Management; L - Groundwater Modeling

Objectives

Upon completion of this correspondence course, participants will be able to:

1. provide groundwater technology required for program analysis, development, and protection of groundwater resource.
2. assist line and staff personnel in the application and evaluation of groundwater technology.

Upon completion of this training, the participant should be able to perform at ASK Level 4, Perform Independently.

Prerequisites

Basic background in geology, basic science, and algebra

Duration

Twenty-two weeks are required to complete each of the two courses offered in January and July of each year. Fifteen to twenty hours per week must be devoted to the course work.

Eligibility

Geologists and others who need intensive groundwater training may attend.

Other Information

Enrollment is made directly with Wright State University, Dayton Ohio. Write: IRIS Program, Center for Groundwater Management, 495 Fawcett Hall, Wright State University, Dayton, OH 45435 or call (513)873-3461.

Engineering

Hydrology Training Series Module 101 - Introduction to Hydrology

Overview

This module provides information on hydrology and the hydrologic cycle and their relationships with NRCS program activities. Common units used in hydrology references are discussed and used in practice problems.

Objectives

Upon completion of this module, participants will be able to:

1. define, in simple terms, hydrology and hydraulics.
2. describe the physical processes that make up the hydrologic cycle.
3. identify, with notes, the terms or units commonly used in hydrology.
4. derive, with notes, the terms or units commonly used in hydrology.
5. identify and locate common NRCS references used in hydrology.

Upon completion of this module, the participant should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

None

Duration

Participant should take as long as necessary to complete the module. Training time for this module is approximately one hour.

Eligibility

This module is intended for all NRCS personnel who use hydrology in their work.

Engineering

Hydrology Training Series Module 102 - Precipitation

Overview

This module presents forms of precipitation and how precipitation is generated, measured, and used in the Natural Resources Conservation Service.

Objectives

Upon completion of this module, participants will be able to:

1. use the various forms of precipitation.
2. describe the physical processes that generate precipitation.
3. list and explain the various methods for measuring precipitation.
4. obtain from available data sources the precipitation values for commonly used conservation practices.
5. list where precipitation values are used.

Upon completion of this module, the participant should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

Module 101 - Introduction to Hydrology

Duration

Trainee should take as long as necessary to complete the module. Training time for the module is about one hour.

Eligibility

This module is intended for all NRCS personnel who use hydrology in their work and for Climatic Data Liaisons.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 103 - Runoff Concepts

Overview

This module discusses runoff data, flood runoff, annual runoff, and three major types of runoff. The important climatic and watershed factors that affect the conversion of storm rainfall to runoff are also presented.

Objectives

Upon completion of this module, participants will be able to:

1. list and define the three types of runoff.
2. list and explain the principal climatic factors that affect runoff.
3. describe the major watershed factors that affect runoff.

Upon completion of this module, the participant should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

Modules 101 - Introduction to Hydrology and 102 - Precipitation

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately one hour.

Eligibility

This module is intended for all NRCS personnel who use hydrology in their work.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 104 - Runoff Curve Number Computations

Overview

This module shows elements needed to calculate a runoff curve number and actual calculations of runoff curve numbers using given field data.

Objectives

Upon completion of this module, participants will be able to:

1. list and describe the elements needed to calculate a runoff curve number.
2. calculate a runoff curve number from given field data.
3. calculate a runoff curve number for complex areas.

The participant should be able to perform at ASK Level 3, Perform with Supervision, after completing this module.

Prerequisites

Module 103 - Runoff Concepts

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately two hours.

Eligibility

This module is intended for all NRCS personnel who calculate runoff curve numbers for a drainage area.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Engineering

Hydrology Training Series Module 105 - Runoff Computations

Overview

This module presents methods to determine runoff using a numerical, a graphical, and two tabular methods.

Objectives

Upon completion of this module, participants will be able to calculate runoff volume when precipitation is known by using the CN procedure for design of a conservation practice.

The participant should be able to perform at ASK Level 3, Perform with Supervision, after completing this module.

Prerequisites

Modules 102 - Precipitation and 104 - Runoff Curve Numbers or their equivalent.

References

National Engineering Handbook, Section 4, Hydrology Engineering Field Manual Technical Release 16, Hydrology

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately one hour.

Eligibility

This module is intended for all NRCS personnel who calculate runoff using the CN procedure.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Engineering

Hydrology Training Series Module 106 - Peak Discharge

Overview

This module covers factors affecting peak discharge and methods of estimating peak discharge using Chapter 2, EFM.

Objectives

Upon completion of this module, participants will be able to:

1. define peak discharge.
2. list the factors that affect peak discharge.
3. identify and select the appropriate methods for computing peak discharge.
4. compute peak discharge using Chapter 2, Engineering Field Manual.

The participant should be able to perform at ASK Level 3, Perform with Supervision, after completing this module.

Prerequisites

Modules 102 - Precipitation; 103 - Runoff Concepts; 104 - Runoff Curve Number Computations; 105-Runoff Computations; or their equivalent

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately two hours.

Eligibility

This module is intended for all NRCS personnel who calculate peak discharge.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Engineering

Hydrology Training Series Module 107 - Hydrographs

Overview

This module shows the various types of hydrographs, defines their components and lists the uses of hydrographs in NRCS.

Objectives

Upon completion of this module, participants will be able to:

1. define hydrograph.
2. list the various types of hydrographs.
3. describe the various hydrograph components.
4. list the uses of hydrographs in NRCS.

The participant should be able to perform at ASK Level 2, Understanding, after completing the module.

Prerequisites

Module 101 - Introduction to Hydrology

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately one hour.

Eligibility

This module is intended for all NRCS personnel who need an introduction or overview of hydrographs.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 111 - Reservoir Flood Routing

Overview

This module presents factors affecting flood routing, developing stage-storage relationships, and a shortcut storage routing method.

Objectives

Upon completion of this module, participants will be able to:

1. list the types of routing.
2. list the factors that affect flood routing.
3. develop a stage-storage discharge relationship for a small structure.
4. use the Engineering Field Manual shortcut flood routing procedure to design small structures.
5. use Technical Release 55 shortcut flood routing procedure to design small structures.

The participant should be able to perform at ASK Level 3, Perform with Supervision, after completing this module.

Prerequisites

Modules 101 - Introduction to Hydrology and 107 - Hydrographs

Duration

Participant should take as long as necessary to complete module. Training time for this module is approximately three hours.

Eligibility

This module is intended for all NRCS personnel who use reservoir flood routing procedures.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 116 - Watershed Yield

Overview

This module presents factors affecting watershed yield, sources and methods used to determine watershed yield, and two methods for estimating watershed yield.

Objectives

Upon completion of this module, participants will be able to:

1. list and describe the factors that affect watershed yield.
2. describe the sources and methods used to determine watershed yield.
3. compute watershed yield using Figure 4, Chapter 11, Engineering Field Manual.

The participant should be able to perform at ASK Level 3, Perform with Supervision, after completing this module.

Prerequisites

Module 101 - Introduction to Hydrology.

References

Chapter 11, Engineering Field Manual USGS Water Supply Paper 2300, "National Water Summary 1985, Hydrologic Events and Surface Water Resources"

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately 2 hours.

Eligibility

This module is intended for all NRCS personnel who calculate runoff using the Engineering Field Manual.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 151 - EFM2 Microcomputer Program

Overview

This module presents information NRCS personnel need to know to effectively apply the EFM2 Microcomputer program to estimate runoff volume and peak flows for small rural watersheds. Included are instructions, activities and tests to measure learning.

Objectives

Upon completion of this module, participants will be able to use the Engineering Field Manual, Chapter 2 (EFM2) computer program to obtain runoff volume and peak inflows. In order to accomplish this, they will:

1. load and read the README.1ST file to define the executable program fines.
2. start the EFM2 System.
3. enter data into the program.
4. develop peak discharge values and runoff volumes.

This module brings the trainee to an ASK Level 3, Perform with Supervision, if used with a microcomputer and the EFM2 program. This module should not be used without the microcomputer and program.

Prerequisites

None

Duration

Participant should take as long as necessary to complete this module. Training time for this module is approximately two hours.

Eligibility

This module is intended for field office employees who have not previously used the EFM2 or similar computer program.

Engineering

Hydrology Training Series Module 201 - Hydrology and Hydraulics In NRCS Programs

Overview

This module provides a brief look at conservation operations, water resources, the snow survey program, flood plain management studies, and the area engineer's role in working with water management agencies. It covers how hydrology and hydraulics interrelate with the programs and agencies.

Objectives

Upon completion of this module, participants will be able to:

1. explain the engineer's role in the hydrologic and hydraulic aspects of major legislated NRCS programs and activities.
2. discuss the area engineer's role in coordinating with state and local water management agencies.

Participants should be able to perform at ASK Level 3, Perform with Supervision, after completing this module.

Prerequisites

Module 101 - Introduction to Hydrology and the New Employee Orientation course

Duration

Participant should take as long as necessary to complete this module. Training time for the module is approximately one hour.

Eligibility

This module is intended for all engineers and others who need to understand the role of hydrology and hydraulics in major NRCS programs and activities.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Engineering

Hydrology Training Series Module 206A - Time of Concentration

Overview

This module presents a step-by-step procedure for calculating the time of concentration using the velocity approach method from TR-55 and the simplified procedure used by NRCS.

Objectives

Upon completion of this module, participants will be able to compute time of concentration (Tc) using the velocity approach concept (TR-55) and the simplified procedure used by NRCS.

Upon completion of this module, participants should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

Module 101 - Introduction to Hydrology, Module 102 - Precipitation

Duration

Participant should take as long as necessary to complete module. Training time for this module is approximately two hours.

Eligibility

This module is intended for all NRCS personnel who calculate time of concentration for a drainage area.

Method of Completion

This module is self study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 206B - Peak Discharge Graphical Method, TR-55

Overview

This module presents the peak discharge equation, input requirements, peak discharge computations, and limitations.

Objectives

Upon completion of this module, participants will be able to compute peak discharge using TR-55, Chapter 4, Graphical Peak Discharge Method.

Upon completion, participants should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

Modules 101- Introduction to Hydrology; 102 - Precipitation; 103 - Runoff Concepts; 104 - Runoff Curve Number Computations, and 206A - Time of Concentration.

Duration

Participant should take as long as necessary to complete the module. Training time for the module is approximately 2 hours.

Eligibility

All area-level engineers and technicians and others who compute peak discharge from areas greater than 2000 acres and from urban watersheds.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions the participant's supervisor is unable to answer.

Engineering

Hydrology Training Series Module 206D - Peak Discharge

Overview

This module presents the Cypress Creek Formula, USGS Regional Equations, and the rational equation. The background, limitations, and procedures appropriate to each method are discussed.

Objectives

Upon completion of this module, participants will be able to identify and use three nonstandard methods to compute peak discharges for specific geographic regions.

Prerequisites

Modules 106 - Peak Discharge; 206A - Time of Concentration; 206B - Peak Discharge (Graphical Method, TR-55)

Reference

Engineering Field Manual, Chapter 2 (1988 version or later).

Duration

Participant should take as long as necessary to complete this module. Training time for the module is approximately two hours.

Eligibility

This module is intended for area-level employees who have a need for special peak discharge procedures.

Method of Completion

This module is self-study, but the requesting office should select a resource person to answer any questions that the participant's supervisor is unable to answer.

Hydrology Training Series Module 251 - TR-55 Microcomputer Program

Overview

This module presents information NRCS personnel need to effectively apply the National TR-55 Microcomputer program to estimate runoff volume and peak flows for small watersheds and for routing through storm water management structures. Included are instructions, activities, and tests to measure learning.

Objectives

Upon completion of this module, participants will be able to use the National Technical Release 55 (TR-55) computer program to obtain runoff volume and peak inflows and to perform shortcut storage routing. In order to accomplish this, they will:

1. load and read the README.1ST file to define the seven executable program files, explain two types of data files and list the advantages of the COUNTY.XX file.
2. start the TR-55 System, find the main MENU and HELP screens and develop a Runoff Curve Number.
3. enter data into the program to compute Times of Concentration and Travel Times.
4. develop peak discharge values using the GRAPHIC Program.
5. develop partial hydrographs and peak discharges using the TABULAR Program.
6. develop peak outflow discharge and required detention basin storage using the STORAGE Program.

This module is designed to bring the trainee to an ASK Level 3, Perform with Supervision, if used with a microcomputer and the TR-55 program. This module should not be used without the microcomputer and program.

Prerequisites

None

Duration

Participant should take as long as necessary to complete the module. Training time is approximately six hours.

Eligibility

This module is intended for area and state level NRCS employees who have not previously used the TR-55 or similar computer program.

Irrigation Training Series Module 911 - Graded Border Irrigation Evaluation

Overview

This module covers calculation of application efficiency and distribution uniformity, performance of a field evaluation, and development of an evaluation report, complete with recommendations for improvement.

Objectives

Upon completion of this module, participants will be able to:

1. perform an evaluation of graded border irrigation using accepted procedures.
2. determine how well the irrigation system is being managed by calculating the application efficiency.
3. determine how well the irrigation system is performing by calculating the distribution uniformity.
4. make recommendations for improvement, if needed, using the results of the evaluation.

This module brings the trainee to an ASK Level 2, Understanding, upon completion of the self-paced portion, and ASK Level 3, Perform with Supervision, upon completion of the field evaluation.

Prerequisites

Glossary of Soil and Water Terms used in the Irrigation Training Series. It is recommended that in order to more fully understand this module, the participant complete one module each from the 300 and 400 series, all modules in the 600 series, and module 960.

Duration

Self-study portion: 8 hours; Facilitator's local example: 4 hours; Field evaluation and report: 16 hours. Credit will be given for 28 hours.

Eligibility

This module is intended for all employees at any level who need training in conducting graded border irrigation system evaluations.

Irrigation Training Series - Module 931 - Center Pivot Sprinkler Irrigation Evaluation

Overview

This module covers calculation of application efficiency and distribution uniformity, performance of a field evaluation, and development of an evaluation report, complete with recommendations for improvement.

Objectives

Upon completion of this module, participants will be able to:

1. perform an evaluation of center pivot sprinkler irrigation using accepted procedures.
2. determine how well the irrigation system is being managed by calculating the application efficiency.
3. determine how well the irrigation system is performing by calculating the distribution uniformity.
4. make recommendations for improvement, if needed, using the results of the evaluation.

This module brings the participant to an ASK Level 2, Understanding, upon completion of the self-paced portion, and ASK Level 3, Perform with Supervision, upon completion of the field evaluation.

Prerequisites

Glossary of Soil and Water Terms Used in the Irrigation Training Series. It is recommended that in order to more fully understand this module, the participant complete one module each from the 300 and 400 series, all modules in the 600 series, and module 960.

Duration

Self-study portion: 8 hours; Facilitator's local example: 4 hours; Field evaluation and report: 16 hours. Credit will be given for 28 hours.

Eligibility

This module is intended for all employees at any level who need training in conducting center pivot sprinkler irrigation system evaluations.

Soil Mechanics Training Series Modules 1, 2 and 3 - Classification of Soils - Level I

Overview

The modules included in this training are:

1. Unified System
2. AASHTO
3. USDA Textural Classes

Objectives

Upon completion of this training, participants will be able to:

1. classify soils by the Unified, AASHTO, and USDA Textural Soil Classification Systems using laboratory data, soil series, and soil map unit descriptions.
2. run simple field identification tests and visually classify soils in the proper grouping of the Unified Soil Classification System.

Upon completion of the three modules, participants should be at ASK Level 2, Understanding. Following the hands-on facilitated session, participants should be able to perform at ASK Level 3, Perform with Supervision.

Prerequisites

None

Duration

22 hours

Eligibility

This module series is intended for engineers, geologists, soil scientists, soil conservationists, technicians, and others needing the fundamentals of soil classification systems used in NRCS.

Soil Mechanics Training Series -Basic Soil Properties Module 4 - Volume-Weight Relations - Level II

Overview

This module provides definitions and equations used in solving basic soil mechanics problems. The field and laboratory measurements needed to obtain parameters for solving these relationships are also covered. A good understanding of these terms and equations is essential to the successful completion of additional soil mechanics modules.

Objectives

Upon completion of this module, participants will be able to:

1. construct a block diagram of a soil mass. From memory, label each of the nine elements with its proper symbol.
2. define conceptually the most important volume-weight relationships from a list.
3. select the proper equations from a given reference table to solve for unknown volume-weight terms.
4. list from memory the four commonly measured laboratory parameters of a soil mass.

Upon completion of this module, participants should be able to perform at ASK Level 4, Perform Independently.

Duration

Module 4 - Volume-Weight Relations is a self-paced program and requires 6 - 8 hours to complete. This includes the time the participants will need to complete activities throughout the module.

Soil Mechanics Training Series -Basic Soil Properties Module 5 - Compaction - Level II

Overview

This module provides instruction on how to explain the theory and application of compaction. It provides instruction on how to develop moisture-density curves based on ASTM standards and how to critically evaluate test results. It also provides instruction on the use of compaction tests in design and quality control of compacted fills.

Objectives

Upon completion of this module, participants will be able to:

1. define terms and use equations in compaction theory and application.
2. perform a standard compaction test, and be able to critically evaluate test results and procedures.

Upon completion of this training, the participant should be able to perform at ASK Level 4, Perform Independently.

Duration

Module 5 - Compaction is a self-paced program and requires approximately 30 hours to complete. This includes the time the participants will need to complete activities throughout the module with one exception. In Part B, Activity 8 the participant is required to perform a compaction test using field equipment and a provided sample. Estimated time for completion of Part B, Activity 8 is 12 hours plus travel time to the session location.